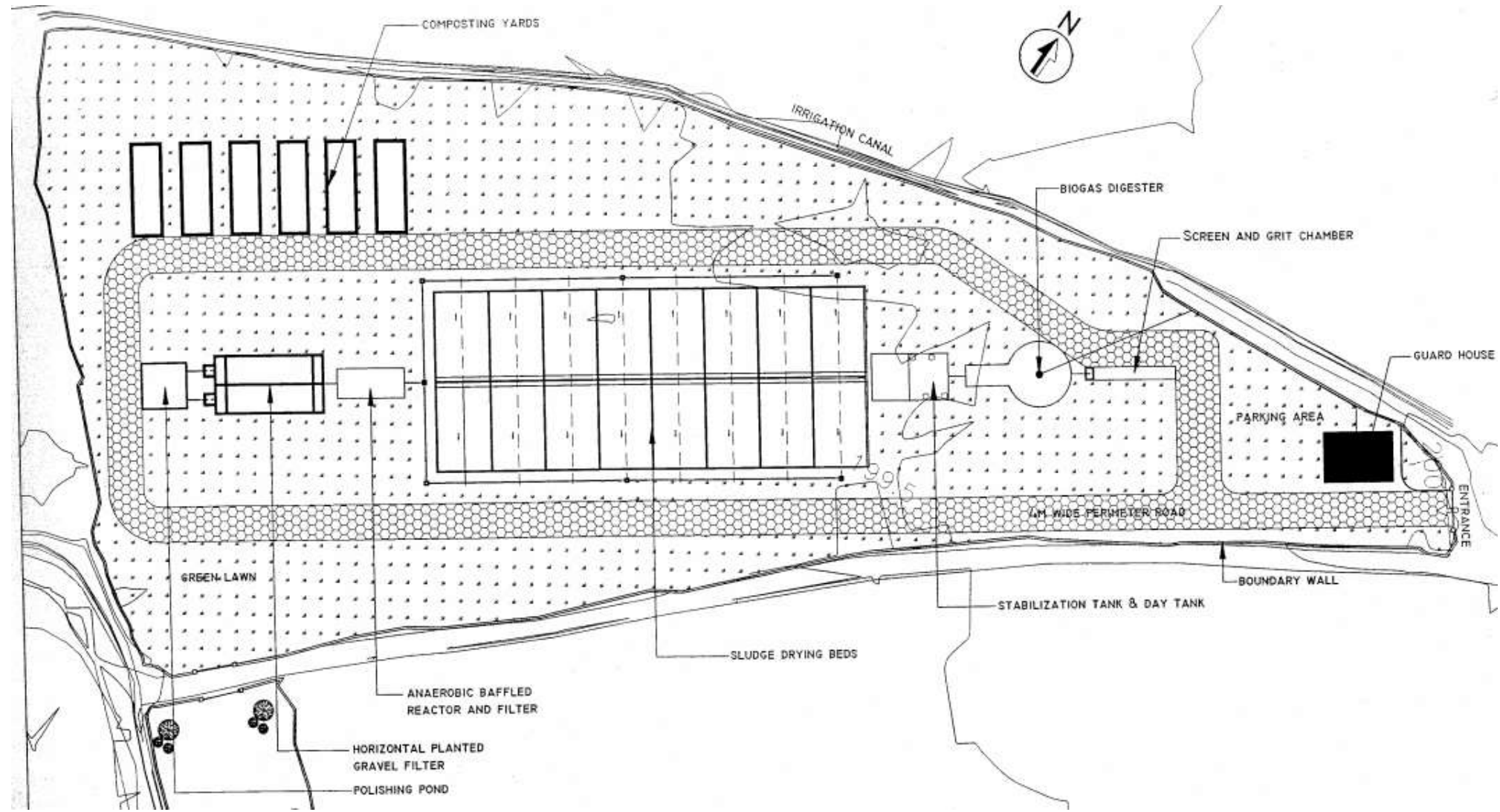


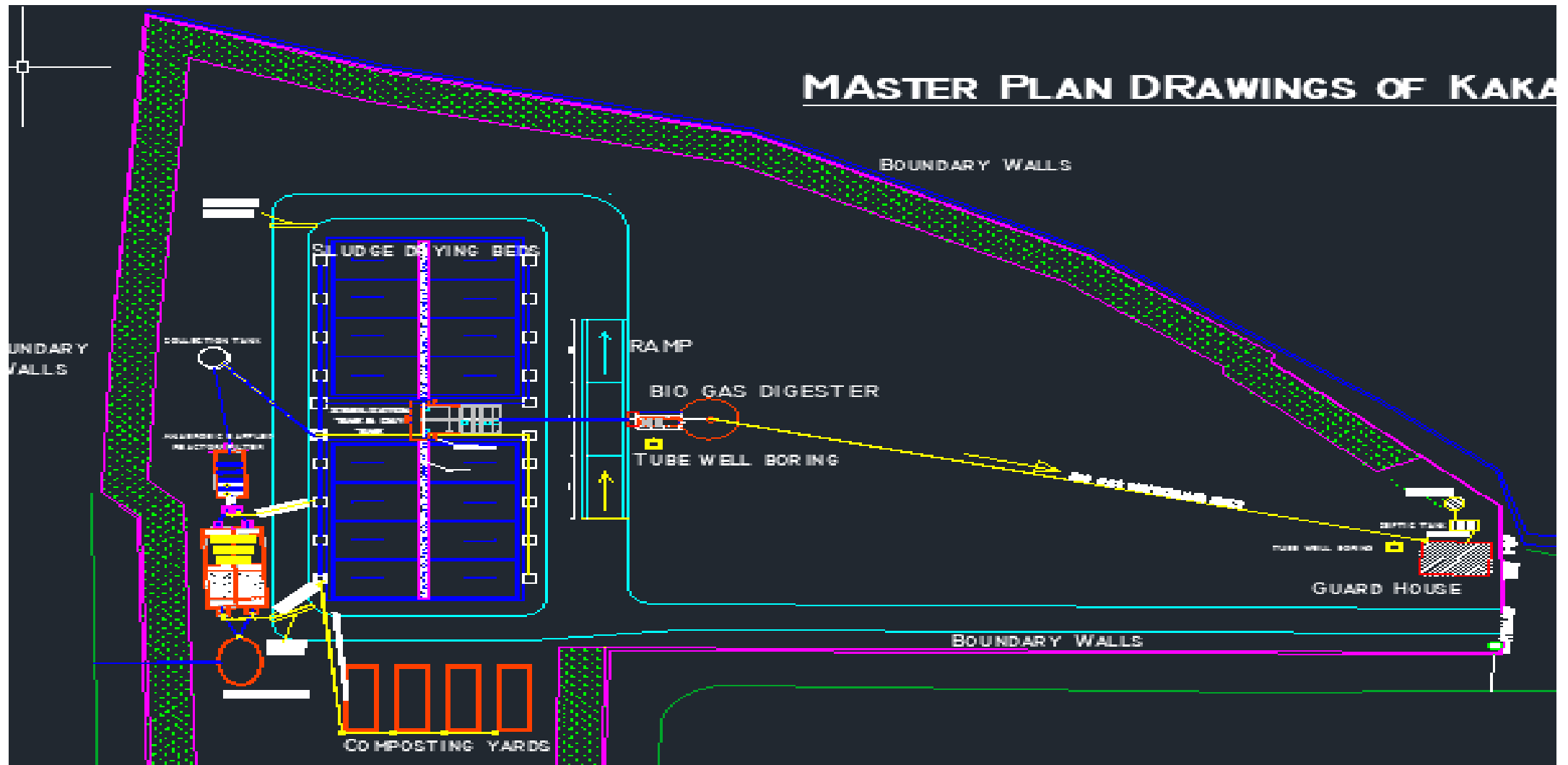
Kakarbhatta FSTP current scenario

Prajwal Shrestha

Master plan - conceptual



Master plan – as built



Changes during construction

- Ramp for desludging vehicle between biogas digester and stabilization tank/ day tank
- FS pass under the ramp from biogas extension chamber to stabilization tank
- The sump well is used to collect liquid percolate from SDB to ABR using pumping system



Bar screen



- Bar screen is working in good order
- No residue waste is seen in the bar screen chamber
- No screen waste collection chamber or pit



Grit chamber



- Grit chamber is working in correct order
- Regularly cleaning frequency is seen
- Grit collected is not high in depth
- No grit collection chamber or pit is provided



Anaerobic digestion chamber



- No initial inoculation feeding was done before feed the FS
- Very less gas produced
- Every two trip of FS input needs to open the SR/DT



Stabilization reactor / Day tank



- Was not accessible to climb up into SR/DT
- Two lines feed into SDB in each side

Sludge drying beds



Sludge drying beds



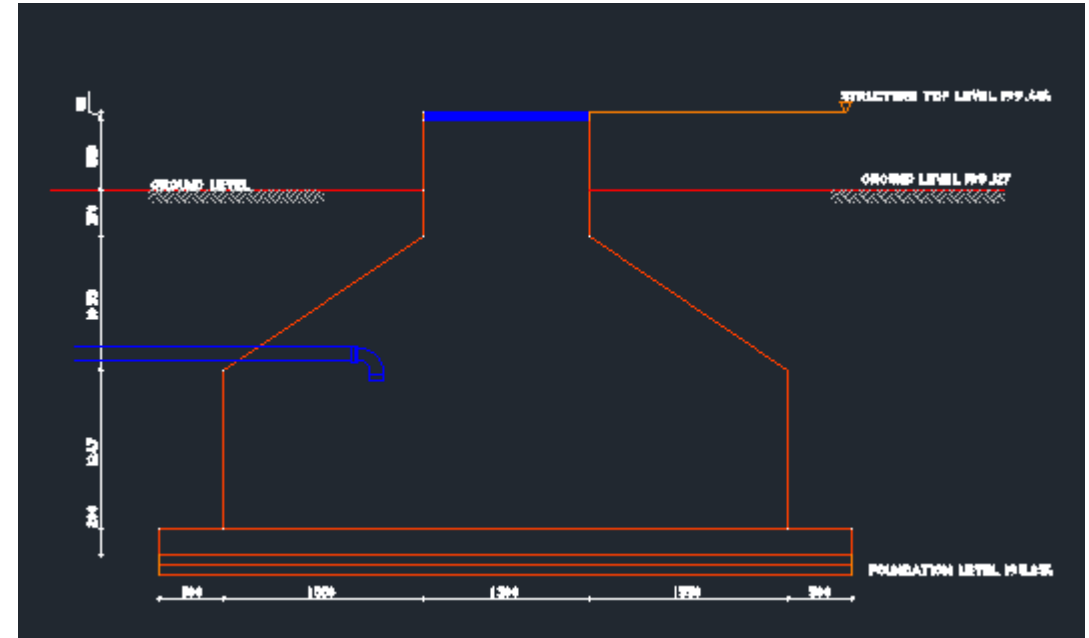
Sludge drying beds

- Unplanted sludge drying beds
- No sludge application cycle in each bed
- SDB units are in three level
- The lowest one gets inundated water from outside into the bed during rainy season
- The percolated water looks without any turbidity, may be due to rain entering the bed



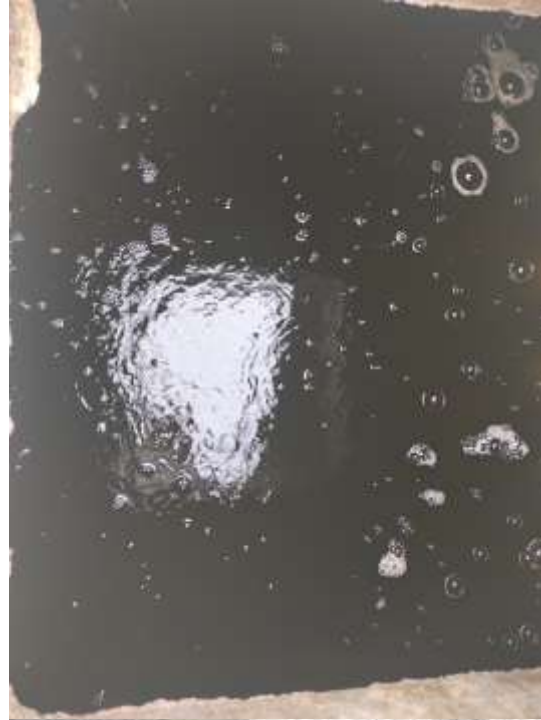
Sump well

- Not provided in original design
- As built drawing has shown as underground collection tank
- A sump well is provided with a pump
- One pump is already in maintenance
- 3 HP pump is provided and operated manually
- Feeds into ABR+AF



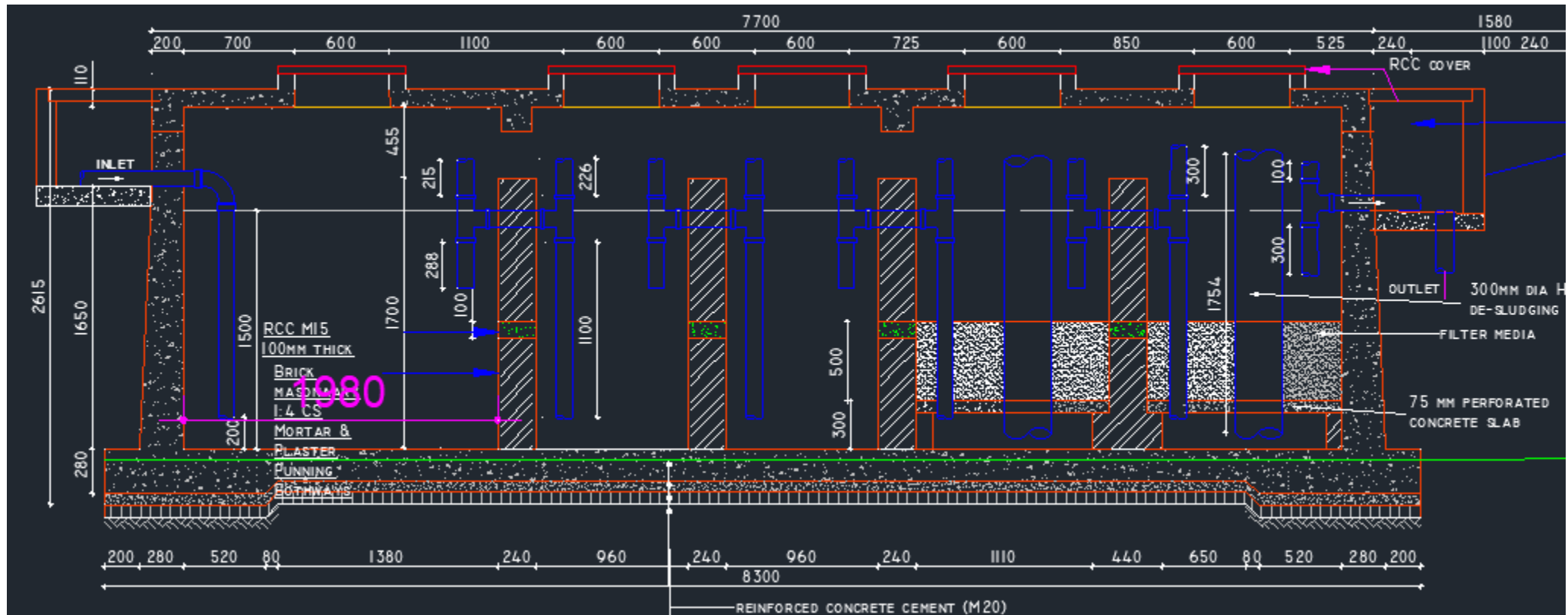
ABR and AF

- No accessibility
- Most of the content is liquid only
- There is a 6" dia. pipe in baffled section for desludging



ABR and AF

- Design: 3 + 3 compartments
- As built drawing: 2 + 2



Constructed wetland

- 2 CW in parallel
- Plants have growing well
- Inlet and outlet are free of solid content



People met during field visit

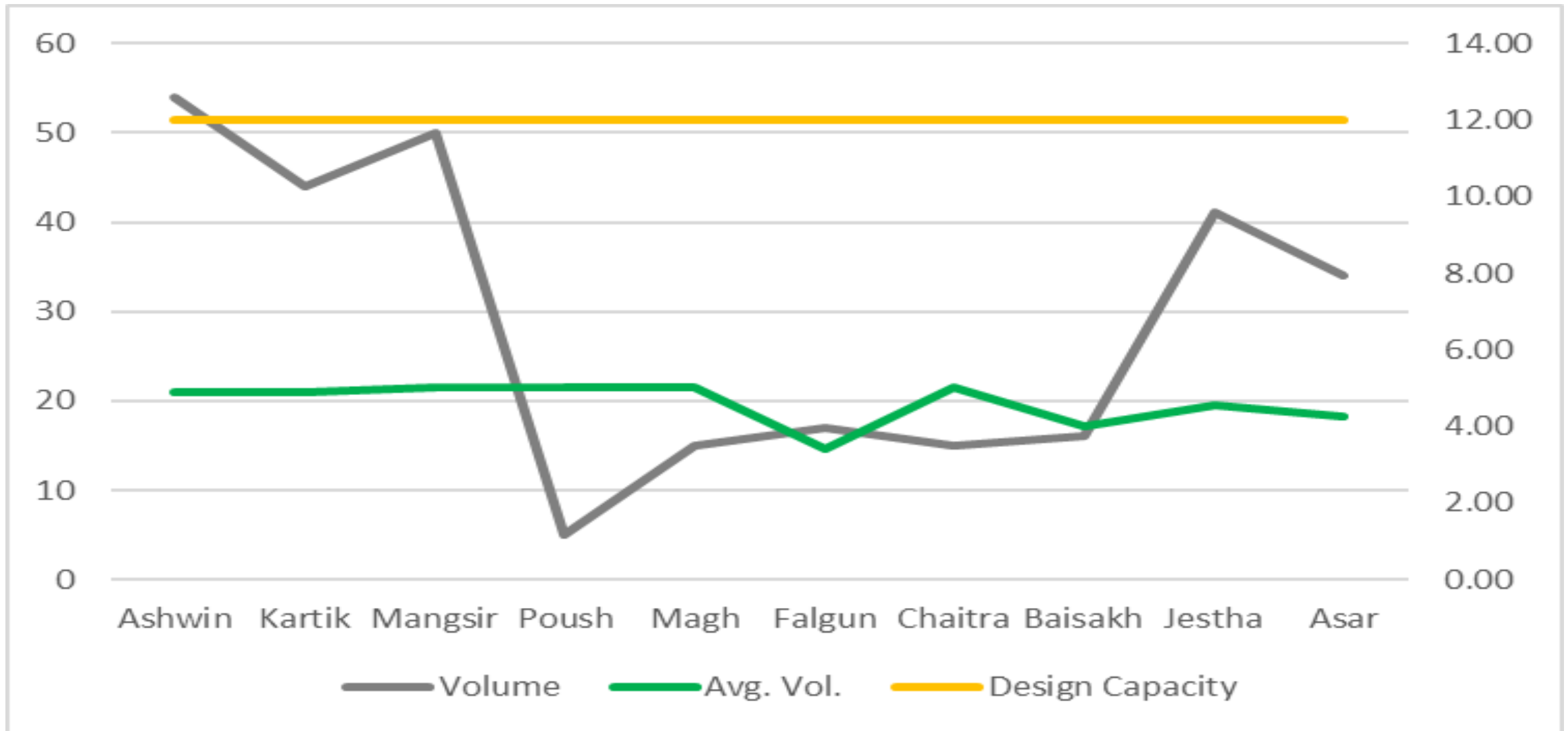
- Plant operator
- Representatives from contractor agency
- Kakarbhitta Water Supply Committee
- Mayor, Mechinagar municipality
- Desludging vehicle driver and operator



Key issues and challenges

- Due to high water table, during rainy season water gets into the lowest level SDB
- Gas is produced in very less quantity
- Turning radius for ramp is insufficient
- Sludge feeding is less compared to the capacity, 5 – 6 truck per month
- Low lying area due to which rain water and increase ground water level inundates the whole area
- Access road is not provide as per master plan

Sludge collection



Sludge collection log

Month	No. of trips	No. of days	Avg. volume per day	Total Volume (m3)
Ashwin	11	8	6.9	55
Kartik	9	7	6.3	44
Mangsir	10	6	8.3	50
Poush	1	1	5	5
Magh	3	1	15	15
Falgun	5	2	8.5	17
Chaitra	3	3	5	15
Baisakh	4	4	4	16
Jestha	9	9	4.6	41
Ashad	8	8	4.3	34

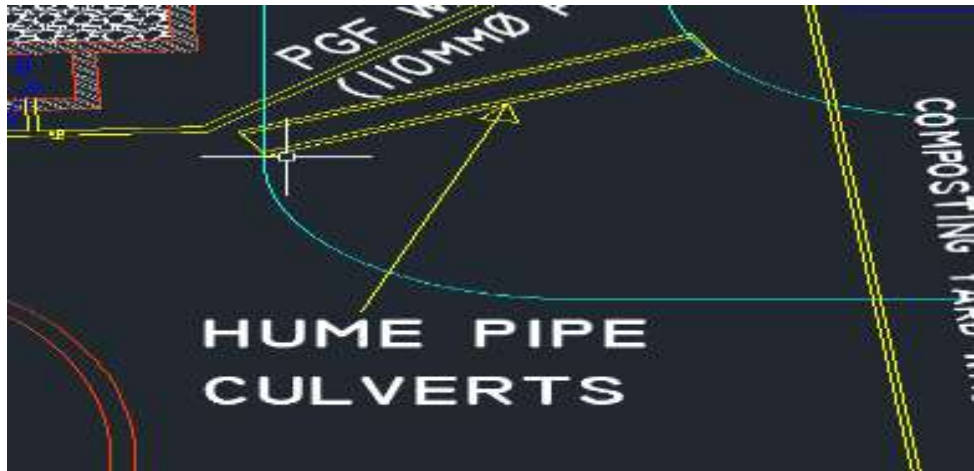
- The system is under utilized
- Total FS volume fed into system – 292 cum
- Biogas digester
 - HRT – 3 days
 - Volume – 88 cum.
 - Extension chamber – 9 cum
 - Should only fill up 3-4 times
- SDB
 - Capacity – 12 cum (0.2m * 60 sqm)
 - Sludge application should only in 3 SDB

Way ahead - 1

- Increase desludging trips
- Municipality to provide bye-law to all desludging services to discharge FS collected in FSTP
- No dumping in tea estate premise, strict monitoring
- Users committee to come up with
 - Advertisement and discounted rate for about 6 months
 - EMI schedule for desludging fee
 - Record keeping of desludging to change from demand based to scheduled

Way ahead - 2

- Improve the site condition
 - Soil backfilling to content high water table condition
 - Provide surface drain to drain high water table to low point, a collection soak pit can be provided
 - Extension of existing drainage provide under the access road



Way ahead - 3

- Provide access stair to stabilization reactor, ABR+AF
- Increase height of walls in SDB, specially low lying one compared to high lying one
- Installation of roofing system for SDB



Way ahead - 4

- Capacity building training on O&M for operator, care taker, technicians
- Wet run of FSTP for O&M
- Cleaning of biogas reactor and inoculation with cow dung before feeding with FS
- Sludge application cycle for SDB
- FSTP operational efficiency test using parameters like TSS, BOD, nitrogen, ammonia
- Biogas meter for monitoring biogas generation

Charali FSTP current scenario

Prajwal Shrestha

Sludge drying beds



SDB

- Reeds are dying in some compartments
- Might be due to some industrial waste or hospital waste with chemicals



Final outlet point



Way ahead

- Some mechanism to check the FS coming into the FSTP
 - May be using a pH paper or digital meter
 - Training to site care takers
 - Maintaining detailed log book, if possible with source of FS



pH Chart

14	High Alkaline
13	Liquid Drain Cleaner
12	Bleach
11	Soapy Water
10	Ammonia
9	Milk of Magnesia
8	Baking Soda
7	Sea Water
6	Neutral pH
5	(Most Tap Water)
4	Healthy Lake (6.5)
3	Clean Rain (5.6)
2	Beer
1	Acidic Lake (4.5)
	Coffee
	Soda Drinks
	Sulfuric Acid
	Battery Acid